

**IN THE UNITED STATES DISTRICT COURT
FOR THE SOUTHERN DISTRICT OF OHIO
EASTERN DIVISION AT COLUMBUS**

IN RE: OHIO EXECUTION
PROTOCOL LITIGATION

: Case No. 2:11-cv-1016

Chief Judge Edmund A. Sargus, Jr.
: Magistrate Judge Michael R. Merz

This document relates to:
Plaintiff Cleveland Jackson

:

**DECISION AND ORDER GRANTING MOTION *IN LIMINE* TO
EXCLUDE EXPERT REPORT AND TESTIMONY OF STEVE YUN**

This case is before the Court on Plaintiff Cleveland Jackson's Motion *in Limine* to Exclude Testimony of Steve C. Yun, M.D. ("Yun Motion," ECF No. 2321). Defendants have filed a Response in opposition (ECF No. 2344). For the reasons set forth below, the Yun Motion is GRANTED.

QUALIFICATIONS AND OPINIONS

Dr. Yun has been a Board-certified anesthesiologist since 2001, has been in private practice as an anesthesiologist since 2000, and is an active physician at Saddleback Memorial Medical Center (Yun Report, ECF No. 2296¹, PageID 111807), although most of his work is in the field of

¹ Dr. Yun originally filed his report on July 24, 2019 (ECF No. 2288); however, he refiled a corrected report the next day to include all materials considered (ECF No. 2296).

pediatric dentistry (<https://www.dentalanesthesiamd.com/>, last accessed Aug. 14, 2019). Dr. Yun states that, through his work, he has administered midazolam “tens of thousands of times[,]” and he has testified as an expert in a case “related to the use of midazolam for lethal injection in Florida.” (Yun Report, ECF No. 2296, PageID 111807, 111809, citing *State of Florida v. Correll*, Orange County (Fla.) No. CR85-3550 (2015)). He has been a clinical professor at the Western University School of Medicine since 2015, and a lecturer at the Loma Linda School of Dentistry since 2017. *Id.* at PageID 111818. While Dr. Yun has conducted several clinical trials, his *curriculum vitae* lists only one peer-reviewed publication: “Practice Guidelines for Adult Sedation and Analgesia,” a co-authored book chapter appearing in SHOBHA MALVIYA, M.D., NORAH N. NAUGHTON M.D., KEVIN K. TREMPER M.D., PH.D., EDS., *SEDATION AND ANALGESIA FOR DIAGNOSTIC AND THERAPEUTIC PROCEDURES* (1st ed. 2003). *Id.* at PageID 111819-20,

Dr. Yun disagrees with the Court’s findings that midazolam “cannot reduce consciousness to the level at which a condemned inmate will not experience the severe pain” of the second and third drugs, or of the pulmonary edema from midazolam, and “that it is the acidic state of injected midazolam that causes pulmonary edema[.]” (Yun Report, ECF No. 2296, PageID 111808). As to the first finding, he reiterates the undisputed point that midazolam can be used as the sole medication for a variety of procedures (e.g., insertion of an endotracheal tube), and as the sole induction agent for anesthesia. *Id.* at PageID 110810-11. He claims that midazolam’s induction of amnesia and a deep hypnotic state within 30-60 seconds of injection means that an inmate will not experience pain from the paralytic or the potassium chloride. *Id.* at PageID 111811-12. Further, he avers, without citation, that execution team members will be able, “using medically appropriate methods, to determine whether the condemned inmate has been rendered sufficiently sedated as to be unaware of any pain produced by administration of the paralytic drug and the

potassium chloride.” *Id.* at PageID 111812.

Dr. Yun states that Jackson’s argument “that the acidic nature of midazolam cause[s] pulmonary edema is illogical.” (Yun Report, ECF No. 2292 PageID 111813). If, as Jackson’s expert Mark A. Edgar, M.D., hypothesizes, it is the acidic nature that “causes venous irritation and damage to the pulmonary vasculature[,]” then it “should also cause painful, venous irritation in an awake person when it is first injected into the vein.” Yet, none of the eyewitness reports cited by Dr. Edgar or Matthew C. Exline, M.D., another of Jackson’s experts, reflects any such irritation. *Id.* Nor do any of the autopsy reports show “venous extravasation [or] infiltration at IV site[,]” which one would expect if the acidic nature of the midazolam was damaging the pulmonary vasculature. “In actuality,” he opines, “any acidic component of the midazolam would rapidly be buffered by the person’s blood as it mixes with venous blood in the right chambers of the heart.” *Id.*

Finally, Dr. Yun disagrees with Jackson’s argument that the movements described by eyewitnesses -- “lurching, straining, heavy breathing, gasping, coughing, etc.[]” -- are caused by the inmates responding to painful stimuli or pulmonary edema, as these can occur even when an individual is resting pain-free after receiving midazolam (Yun Report, ECF No. 2296, PageID 111814). He claims that these movements can happen just as easily when an inmate has been administered opioids, such as propofol, and “are not sufficient proof of consciousness or a purposeful response to pain.” *Id.* Dr. Yun also claims that midazolam is so potent at the dosage used in the execution that, by itself it can induce fatal levels of unconsciousness or respiratory depression, but, in that process, also elevates carbon dioxide levels in the blood. Those elevated levels may, in turn, cause some of the described movements. *Id.* at PageID 111812, 111814.

LEGAL STANDARDS

Federal Rule of Evidence 702 sets forth the requirements for the admissibility of expert testimony as follows:

A witness who is qualified as an expert by knowledge, skill, experience, training, or education may testify in the form of an opinion or otherwise if:

(a) the expert's scientific, technical, or other specialized knowledge will help the trier of fact to understand the evidence or to determine a fact in issue;

(b) the testimony is based on sufficient facts or data;

(c) the testimony is the product of reliable principles and methods;
and

(d) the expert has reliably applied the principles and methods to the facts of the case.

The wording of the rule reflects the now-standard inquiry set out in *Daubert v. Merrell Dow Pharms., Inc.*, 509 U.S. 579 (1993), which is the basis on which the Court must analyze the expert testimony offered in this case.² See, e.g., *Nelson v. Tenn. Gas Pipeline Co.*, 243 F.3d 244, 250 n.4 (6th Cir. 2001). Under Rule 702, as interpreted in *Daubert*, the trial judge must exercise a “gatekeeping” function and “ensure that any and all scientific testimony or evidence admitted is not only relevant, but reliable.” *Id.* at 589. “[I]n order to qualify as ‘scientific knowledge,’ an inference or assertion must be derived by the scientific method.” *Id.* at 590. In a case involving scientific evidence, evidentiary reliability will be based on scientific validity. *Id.* at n.9. Factors bearing on whether reasoning is scientifically valid include: can the theory or technique be tested;

² Although the language of Rule 702 has been changed since *Daubert*, “[t]hese changes are intended to be stylistic only. There is no intent to change any result in any ruling on evidence admissibility.” Fed.R.Evid. 702 Cmte. Note on Rules (2011).

has it been subjected to peer review and publication, what is the known or potential rate of error, has it been generally accepted? *Id.* at 593-594 (citations omitted). The United States Court of Appeals for the Sixth Circuit requires a trial judge to take a hard look at scientific evidence. *Turpin v. Merrell Dow Pharms., Inc.*, 959 F.2d 1349, 1352 (6th Cir. 1992) (cited favorably in *Daubert*, 509 U.S. at 596). Expert testimony based on scientific research done solely for litigation that is neither subjected to peer review nor published in scientific journals and is not accompanied by showing of methodology on which it is based is not admissible under Rule 702. *Johnson v. Manitowoc Boom Trucks, Inc.*, 484 F.3d 426, 434-35 (6th Cir. 2007), citing *Daubert v. Merrell Dow Pharms, Inc.*, 43 F.3d 1311, 1317-18 (9th Cir. 1995) (on remand from the Supreme Court).

Therefore, we review this case under *Daubert*, which set forth a non-exclusive checklist of factors for trial courts to use in assessing the reliability of proffered scientific expert testimony. These include 1) whether the expert's scientific technique or theory can be, or has been, tested; 2) whether the technique or theory has been subject to peer review and publication; 3) the known or potential rate of error of the technique or theory when applied; 4) the existence and maintenance of standards and controls; and 5) whether the technique or theory has been generally accepted in the scientific community. *Daubert*, 509 U.S. at 592-95; *Hardyman v. Norfolk & W. Ry.*, 243 F.3d 255, 260 (6th Cir. 2001). If the evidence is deemed to be reliable and relevant, the judge must then determine if the probative value of the evidence is outweighed by its prejudicial effect. *Daubert*, 509 U.S. at 595, citing Fed.R.Evid. 403.

Analysis

A. Dr. Yun's opinions are belied by his limited, contradictory scholarly research

Unlike many of the experts produced by both sides in this litigation who have spent their careers in academia and whose opinions are supported by decades of their own research and scholarly publications, Dr. Yun has spent most of his career in private practice, and has not published any scholarly articles, aside from the aforementioned co-authored book chapter from 2003. This lack of research and publication of his conclusions in any scholarly journal gives rise to serious doubts about whether his reasoning is scientifically valid. *Daubert*, 509 U.S. at 593-94. Moreover, as Jackson points out, the book chapter that Yun co-authored states “unequivocally that ‘Benzodiazepines produce anxiolysis and amnesia, not analgesia[,]’” and that “‘Benzodiazepines alone rarely cause apnea.’” (Yun Motion, ECF No. 2321, PageID 113118 (citation omitted)).³ Both of these statements are contrary to the statements included in his expert report, in which he states that 500 mg of midazolam would render a person unable to perceive the pain from the paralytic and potassium chloride, the second and third drugs, respectively, in Ohio’s execution protocol, and that overdoses of midazolam can cause fatal apnea episodes (Yun Report, ECF No. 2296, PageID 111811). Nowhere in his report does Dr. Yun attempt to explain these facial contradictions, or why his changed positions are correct. That Dr. Yun’s prior positions were published in a medical textbook, whereas his current positions were not subject to peer review and editing, and were prepared only in preparation to this litigation, weighs heavily against finding the

³ While neither Defendants nor Jackson attaches as an exhibit the book chapter, Defendants, in the memorandum *contra*, do not dispute the accuracy of Jackson’s quotations from it.

opinions set forth in the Yun Report reliable.

B. Dr. Yun's current opinions are belied by the best evidence proffered by the parties

Dr. Yun cites to RONALD D. MILLER, ET AL., MILLER'S ANESTHESIA (8th ed. 2015)—which Defendants' expert Joseph M. Antognini, M.D. conceded, in his expert report offered against Warren Henness—is “the most accepted textbook in the field” (ECF No. 1983, PageID 88448), for the undisputed proposition that “[m]idazolam has been used for the induction of anesthesia” (Yun Report, ECF No. 2296, PageID 111810, citing *Miller's Anesthesia*, ECF No. 2296-5, PageID 111881). Yet, *on the same page* relied upon by Yun, the authors continue: “Benzodiazepines *lack analgesic properties and must be used with other anesthetic drugs to provide sufficient analgesia*; however, as maintenance anesthetic drugs during general anesthesia, benzodiazepines provide hypnosis and amnesia.” (*Miller's Anesthesia*, ECF No. 2296-5, PageID 111881 (emphasis added)). This statement, from the leading treatise in the field of anesthesia, is consistent with Dr. Yun's previously published statement that “[b]enzodiazepines produce anxiolysis and amnesia, not analgesia” (Yun Motion, ECF No. 2321, PageID 113118). The statement in *Miller's Anesthesia* is inconsistent with Dr. Yun's statement that an inmate given 500 mg of midazolam will not experience pain from injection of the paralytic and potassium chloride (Yun Report, ECF No. 2296, PageID 111812).

Dr. Yun's other citations to outside sources are scant, largely irrelevant, and provide no support for the positions in his Report. He cites two sources for the propositions that midazolam may be used as the sole agent for *induction* of general anesthesia, and that “there is typically no

awareness or recall of a painful stimulus such as intubation or surgery[.]” (Yun Report, ECF No. 2296, PageID 111810-11, citing Jeevan Singh, *Midazolam as an induction agent in comparison with propofol as a safe and effective alternative*, 34:1 J. OF INST. OF MED. 25 (Apr. 2012); M.E. Crawford, et al., *A randomized comparison between midazolam and thiopental for elective cesarean section anesthesia*, 68 ANESTHESIA ANALGESIA 229-33 (1989)). The former proposition, as discussed above, is undisputed; the latter proposition appears to deal with midazolam’s *amnesic* properties, which are not at issue. In support of his argument that “toxic doses of midazolam can produce profound respiratory depression and elevated carbon dioxide levels in the blood[.]” he cites two journal articles, both of which predate the development of midazolam by more than twenty years. *Id.* at PageID 111814, citing E. Keith Westlake and Kaye M. Simpson, *Respiratory Failure and Carbon Dioxide Narcosis*, 34 POSTGRAD MED. J. 2-6 (Jan. 1958; Herbert O. Sieker and John B. Hickam, *Carbon Dioxide Intoxication: The clinical syndrome, its etiology and management with particular reference to the use of mechanical respirators*, 35(4) MED. 389-423 (Dec. 1956)). In addition to the authors’ being unable to opine on whether respiratory depression can be caused by midazolam—because it did not yet exist—Dr. Yun’s conclusion about respiratory depression is seemingly contradicted by his statement in his book chapter that “[b]enzodiazepines alone rarely cause apnea.” (Yun Motion, ECF No. 2321, PageID 113118). Dr. Yun does not explain this facial contradiction; nor does he attempt to explain the supposed impact of elevated carbon dioxide levels on an inmate’s ability to feel pain.

Defendants claim that Jackson’s argument is “that Dr. Yun’s opinions are not reliable because he relies on the studies of others rather than his own research or that they are nearly the same as other of the Defendants’ experts.” (Memo. in Opp., ECF No. 2344, PageID 114346). Not so. Rather, there is no indication that Dr. Yun relied on any study or research—either his own or

that of others—in reaching his conclusions. In sum, Dr. Yun’s citations to peer-reviewed sources are either belied by the very sources he quotes, pertain to arguments immaterial to this litigation, or are bereft of any context that would allow the Court to discern how the sources support the vague, otherwise-unsubstantiated conclusions. The sources do nothing to change the fact that the opinions set forth in his report are directly contradicted by the scientific consensus regarding midazolam’s inability to produce analgesia or maintain anesthesia. *See In re Ohio Execution Protocol Litig. (Henness)*, No. 2:11-cv-1016, 2019 WL 244488, at *62-65 (S.D. Ohio Jan. 14, 2019) (Merz, Mag. J.) (After hearing evidence from Henness and Defendants’ experts, finding Henness’s experts⁴ more credible and finding that “that it is certain or very likely that a 500 mg [intravenously]-injected dose of midazolam cannot reduce consciousness to the level at which a condemned inmate will not experience the severe pain associated with injection of the paralytic drug or potassium chloride . . .”). For these reasons, Dr. Yun’s Report fails the requirements of Rule 702 and *Daubert*.

C. Dr. Yun’s current opinions are conclusory and derivative of those offered by Dr. Antognini

The entire substance of Dr. Yun’s opinions is contained in eleven sub-paragraphs in the Report. Sub-paragraphs 9.a, 9.b., and 9.k are unreliable for the reasons set forth *supra*. Sub-paragraphs 9.c through 9.h and 9.j (Yun Report, ECF No. 2296, PageID 111811-12, 111814) are bald, conclusory statements, and Dr. Yun includes no citations to scientific publications or experiment results to support the statements. These statements lack any of the indicia of reliability

⁴ Mark A. Edgar, M.D.; Matthew C. Exline, M.D.; David J. Greenblatt, M.D.; Daniel Lubarsky, M.D.; and Craig Stevens, Ph.D., all of whom have offered reports in support of Jackson, and/or whose prior reports and testimony are going to be admitted into evidence by this Court (ECF Nos. 2160, 2257, 2258, 2260, 2331, 2333, 2334).

required under Fed.R.Evid. 702 and *Daubert*, and consequently, should not be considered by the Court. In sub-paragraph 9.i, he states that he “reviewed the data cited in plaintiff’s expert reports related to autopsies performed on inmates who were executed with lethal injection[,]” and terms the position of Dr. Edgar that midazolam causes pulmonary edema “illogical.” (Yun Report, ECF No. 2296, PageID 111813). Yet, Dr. Yun does not explain why he is qualified to draw that conclusion from Dr. Edgar’s reports, as he does not appear to have training as a pathologist. Moreover, the only source he cites in support of that conclusion is what purports to be a direct quotation from Dr. Antognini.⁵ *Id.* at PageID 111813-14. Dr. Antognini has submitted four expert reports in this case (ECF Nos. 852-1 (addendum at ECF No. 887-1), 1310-1, 1983, 2291), and testified in this Court as recently as December 2018 (Hennes Hrg. Tr., ECF No. 2120); needless to say, the Court is very familiar with Dr. Antognini’s opinions on midazolam.

Defendants argue that “[o]ne would expect each side of this issue to have similar opinions among each of its experts[,]” and the fact that Dr. Yun’s opinions are in concert with those of Dr. Antognini does not render them cumulative any more than Jackson’s experts expressing largely the same opinions regarding midazolam’s supposed properties, effects, and limitations (Memo. in Opp., ECF No. 2344, PageID 114346). Yet, contrary to their argument, the issue is not that Drs. Yun and Antognini agree as to the supposed effects and limitations of midazolam; it is that Dr. Yun’s opinion is *derivative* of that of Dr. Antognini. In other words, but for Dr. Antognini’s opinion, Dr. Yun’s opinion that midazolam does not cause pulmonary edema would be baseless. Thus, even if Dr. Yun’s recitation of Dr. Antognini’s opinion would not be excludable under Rule 702, it would be properly excluded as “wasting time[and] needlessly presenting cumulative evidence.” Fed.R.Evid. 403.

⁵ Dr. Yun does not state the document, much less the PageID, from which the quotation came.

D. Defendants' remaining arguments are immaterial and unavailing

Defendants note correctly that “[i]t has long been the rule in [the United States Court of Appeals for] the Sixth Circuit that ‘Rule 702 should be broadly interpreted on the basis of whether the use of expert testimony will assist the trier of fact[,]’” (Memo. in Opp., ECF No. 2344, PageID 114347, quoting *Davis v. Combustion Eng’g, Inc.*, 742 F.2d 916, 919 (6th Cir. 1984)), and that this Court would abuse its discretion in excluding Dr. Yun because it “does not deem [him] be the best qualified or because the proposed expert does not have the specialization the court considers most appropriate.” *Id.*, quoting *Burgett v. Troy-Bilt LLC*, 579 F. App’x 372, 380 (6th Cir. 2014). The Court passes no judgment on Dr. Yun’s experience and expertise as a Board-certified anesthesiologist and in using midazolam in clinical doses thousands of times in his career. Rather, his opinions offered are rarely more than bald conclusions, with scant citations to other sources, and in some places, contradicted by his own studies. His opinion would in no way assist the Court in making factual findings regarding whether midazolam will render an inmate incapable of feeling the pain caused by the second and third drugs in the State of Ohio’s execution protocol, or independently causes pulmonary edema. Accordingly, by the Sixth Circuit’s own precedent, excluding Dr. Yun is proper.

Defendants note that in *Glossip v. Gross*, the Supreme Court upheld the denial of the plaintiff’s *Daubert* motion to exclude Roswell Evans, Pharm.D., “reiterat[ing] the District Court’s conclusion that Dr. Evans, the Dean of Auburn University’s School of Pharmacy, ‘was well qualified to testify about midazolam’s properties and that he offered reliable testimony.’” (Memo. in Opp., ECF No. 2344, PageID 114347-48, quoting *Glossip*, 135 S.Ct. 2726, 2736 (2015)). The district court’s decision not to exclude Dean Evans’s testimony was reviewed under an abuse of

discretion standard; without more, it is not reasonable to infer that the Supreme Court would have reached the same conclusion on *de novo* review. Moreover, the very language in *Glossip* quoted by Defendants undermines their argument. While Dr. Yun avers that he is “familiar with the administration and properties of the drug midazolam,” (Yun Report, ECF No. 2296, PageID 111807), his explanations of midazolam’s properties (induction of anesthesia, production of hypnosis and amnesia) are at turns unsupported, cumulative, or immaterial to the issues being litigated. Finally, for the reasons discussed above, Dr. Yun’s Report lacks the indicia of reliability that the Court, in exercising its gatekeeper function, must be sure are present prior to considering his Report and allowing his testimony.

CONCLUSION

For the foregoing reasons, Jackson’s Motion to Exclude the Testimony of Defendants’ Expert Witness Dr. Steve C. Yun (ECF No. 2321) is GRANTED. Dr. Yun may not testify at the anticipated evidentiary hearing on Jackson’s motion for preliminary injunction, and his Expert Report (ECF No. 2296) will not be considered by the Court in adjudicating Jackson’s motion.

August 15, 2019.

s/ ***Michael R. Merz***
United States Magistrate Judge